

Missouri Department of Natural Resources  
**Total Maximum Daily Load Information  
Sheet**

## **Big Otter Creek and Tributary to Big Otter Creek**

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### **Waterbody Segment at a Glance:**

**Counties:** Henry and St. Clair  
**Nearby Cities:** Brownington  
**Length of impairment:**  
• **Big Otter Creek:** 1.0 mile  
• **Tributary:** 1.0 mile  
**Pollutant:** pH  
**Source:** Otter Creek Abandoned  
Mine land



**Note:** The current assessment of Big Otter Creek and Tributary to Big Otter Creek is based on water quality sampling conducted since the development of the 2002 303(d) list. This assessment still lists one mile of the tributary as impaired. New information obtained since then indicates that Big Otter Creek is not impaired.

### **TMDL Priority Ranking:**

Big Otter Creek: N/A

Tributary to Big Otter Creek: Medium

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### **Beneficial uses of Big Otter Creek and Tributary**

- Livestock and Wildlife Watering
- Protection of Warm Water Aquatic Life
- Fish Consumption by Humans

### **Use that is impaired**

- Protection of Warm Water Aquatic Life

### **Standards that apply**

- Missouri Water Quality Standards for pH found in 10 CSR 20-7.031(3)(E) state: "Water contaminants shall not cause pH to be outside of the range of 6.5-9.0."

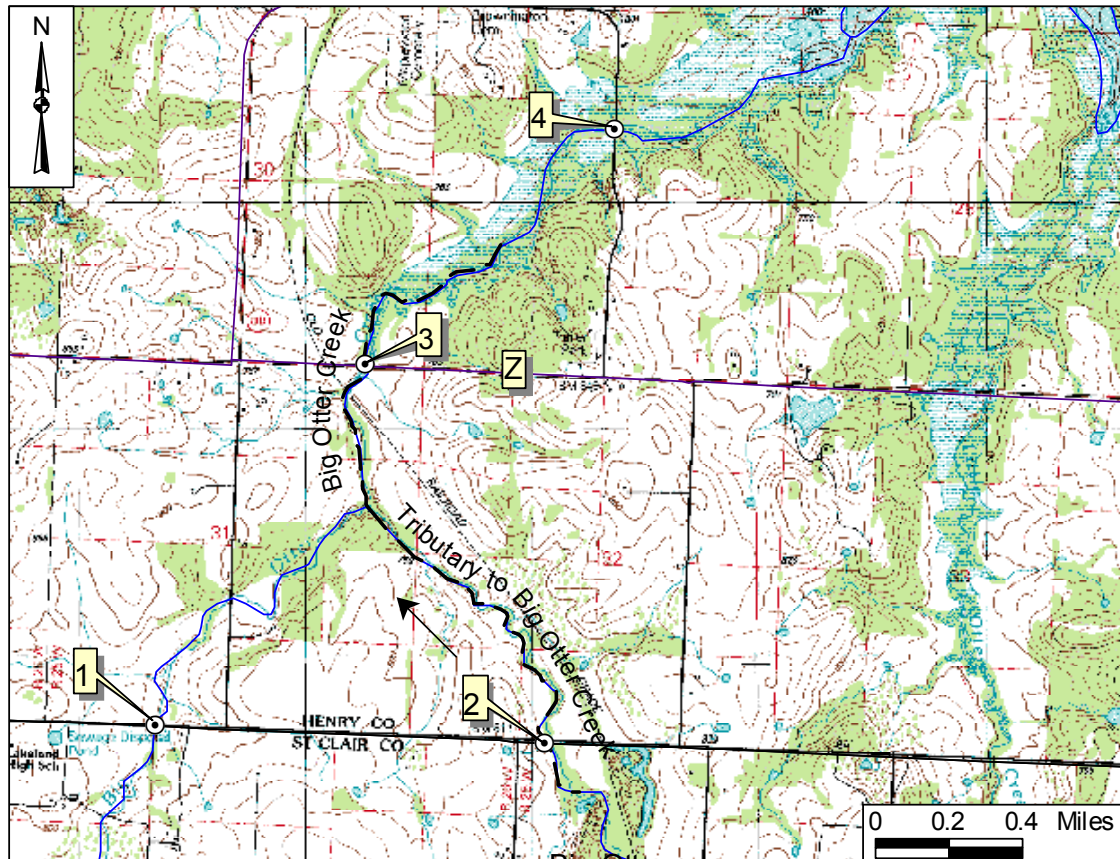
### **Description of the Problem**

The Tributary to Big Otter Creek in northern St. Clair County and southern Henry County drains a 75 acre area of acidic coal wastes. Acid mine drainage was believed to affect all of Big Otter Creek between this coal waste area and Truman Reservoir. This resulted in numerous fish kills in the stream. The last mine-related fish kill in Big Otter

Creek occurred in 1987. Landowners along the creek asserted that the poor water quality was affecting their livestock. The Department of Natural Resources reclaimed this area in 1998 at a cost of \$955,964. A 25 acre lake provides water to dilute the acid mine drainage, and a small dilution pond was constructed to collect the numerous acid seeps. The area was revegetated with native and cool season grasses.

Sulfide minerals, commonly found in coal and the surrounding rock, oxidize when exposed to the air and are subsequently dissolved by surface flows and groundwater. This weathering process results in sulfuric acid forming and then showing up in the surface runoff and shallow groundwaters that feed the creeks. Freshwater aquatic life cannot tolerate acidic (low pH) water. Water quality sampling in 1999 showed the Tributary to Big Otter contained water too acidic to meet state water quality standards. Information obtained since 2002, however, has shown that Big Otter Creek is not impaired due to low pH. Big Otter Creek will be proposed for removal from the impaired waters list at the next listing cycle. Water quality monitoring of both Big Otter Creek and this tributary continues. A TMDL document has been written for Tributary to Big Otter to address the acidity impairment and ensure protection of aquatic life.

## Map of Big Otter Creek and Tributary to Big Otter Creek Showing Sampling Locations



Impaired Segment
  Direction of Flow

### Sampling Sites

- Site #1 Big Otter Creek
- Site #2 Trib. Big Otter Cr. 0.5mi.bl. AML
- Site #3 Big Otter Cr. at Hwy Z
- Site #4 Big Otter Cr. near mouth

## Appendix D DATA

| Site    | Site Name                         | Year | Month | Day | Time | Flow | Temp<br>°C | DO  | pH         | SC   | Alk | Acid | SO4 | Cl  |
|---------|-----------------------------------|------|-------|-----|------|------|------------|-----|------------|------|-----|------|-----|-----|
| Site #1 | Big Otter Creek                   | 1996 | 2     |     |      |      | 11         |     | 8.1        | 730  |     |      |     |     |
| Site #1 | Big Otter Creek                   | 1997 | 10    |     |      | 0    | 11         |     | 7          | 310  |     |      |     |     |
| Site #2 | Trib. Big Otter Cr. 0.5mi.bl. AML | 1996 | 2     |     |      | 0.1  | 10         |     | <b>3.1</b> | 1370 |     |      |     |     |
| Site #2 | Trib. Big Otter Cr. 0.5mi.bl. AML | 1997 | 10    |     |      | 0    | 11         |     | <b>3.3</b> | 1150 |     |      |     |     |
| Site #2 | Trib. Big Otter Cr. 0.5mi.bl. AML | 2000 | 8     | 4   | 1200 | 0    |            |     | <b>4.9</b> | 290  | 0   | 4    | 125 | 6   |
| Site #2 | Trib. Big Otter Cr. 0.5mi.bl. AML | 2002 | 7     | 5   |      | 0.01 | 26         |     | <b>3.5</b> | 580  | 2.5 | 118  | 361 | 5.9 |
| Site #2 | Trib. Big Otter Cr. 0.5mi.bl. AML | 2002 | 8     | 28  | 1115 | 0    | 22         |     | <b>4.4</b> | 412  | 2.5 | 136  | 169 | 8   |
| Site #2 | Trib. Big Otter Cr. 0.5mi.bl. AML | 2003 | 5     | 14  | 1120 |      | 17         | 7.6 | 6.6        | 420  | 11  | 32   | 140 | 15  |
| Site #2 | Trib. Big Otter Cr. 0.5mi.bl. AML | 2003 | 5     | 29  | 1120 |      | 18         | 6.9 | 6.9        | 505  | 2.5 | 74   | 198 | 14  |
| Site #2 | Trib. Big Otter Cr. 0.5mi.bl. AML | 2003 | 6     | 10  | 900  |      | 18         | 7.1 | 6.6        | 622  | 10  | 42   | 126 | 14  |
| Site #2 | Trib. Big Otter Cr. 0.5mi.bl. AML | 2003 | 7     | 29  | 1010 | 0    | 23         |     | <b>6</b>   | 510  | 2.5 | 12   | 196 | 13  |
| Site #2 | Trib. Big Otter Cr. 0.5mi.bl. AML | 2003 | 12    | 3   | 1225 | 1    | 3          | 12  | 6.9        | 582  | 2.5 | 33   | 143 | 12  |
| Site #2 | Trib. Big Otter Cr. 0.5mi.bl. AML | 2003 | 12    | 30  | 1120 | 1    | 4.5        |     | <b>5.9</b> | 295  | 5   | 50   | 100 | 11  |
| Site #2 | Trib. Big Otter Cr. 0.5mi.bl. AML | 2004 | 2     | 25  | 1310 |      | 4          | 11  | 7          | 520  | 6   | 16   | 133 | 16  |
| Site #3 | Big Otter Creek at Hwy Z          | 1997 | 10    |     |      | 0    | 14         |     | 7.3        | 536  |     |      |     |     |
| Site #3 | Big Otter Creek at Hwy Z          | 2002 | 7     | 5   |      | 0.3  | 27         |     | 7.2        | 693  | 156 | 2.5  | 96  | 50  |
| Site #3 | Big Otter Creek at Hwy Z          | 2002 | 8     | 28  | 1100 | 0    |            |     |            |      |     |      |     |     |
| Site #3 | Big Otter Creek at Hwy Z          | 2003 | 5     | 14  | 1040 |      | 16         | 8.6 | 7.2        | 377  | 86  | 2.5  | 75  | 16  |
| Site #3 | Big Otter Creek at Hwy Z          | 2003 | 5     | 29  | 1050 |      | 17         | 7.4 | 7          | 460  | 101 | 2.5  | 78  | 17  |
| Site #3 | Big Otter Creek at Hwy Z          | 2003 | 6     | 10  | 830  |      | 18         | 7.3 | 7.3        | 790  | 95  | 2.5  | 66  | 17  |
| Site #3 | Big Otter Creek at Hwy Z          | 2003 | 12    | 3   | 1210 |      | 4          | 11  | 7.1        | 466  | 124 | 2.5  | 98  | 40  |
| Site #3 | Big Otter Creek at Hwy Z          | 2003 | 12    | 30  | 1110 | 1.5  | 4          |     | 7.3        | 323  | 56  | 2.5  | 69  | 14  |
| Site #3 | Big Otter Creek at Hwy Z          | 2004 | 2     | 25  | 1230 |      | 5          | 10  | 7.5        | 460  | 66  | 2.5  | 81  | 19  |
| Site #4 | Big Otter Creek near mouth        | 2003 | 5     | 14  | 1210 |      | 17         | 8   | 7.2        | 520  | 85  | 2.5  | 95  | 19  |
| Site #4 | Big Otter Creek near mouth        | 2003 | 5     | 29  | 1200 |      | 18         | 7.4 | 7.4        | 563  | 90  | 2.5  | 74  | 19  |
| Site #4 | Big Otter Creek near mouth        | 2003 | 6     | 10  | 940  |      | 19         | 7.9 | 7.4        | 497  | 88  | 2.5  | 65  | 18  |
| Site #4 | Big Otter Creek near mouth        | 2003 | 12    | 3   | 1245 |      | 4          | 11  | 7.5        | 489  | 90  | 2.5  | 94  | 27  |
| Site #4 | Big Otter Creek near mouth        | 2004 | 2     | 25  | 1135 |      | 4          | 9.8 | 7.6        | 485  | 57  | 2.5  | 93  | 19  |

Source: Missouri Department of Natural Resources

**Bolded numbers** indicate values outside Water Quality Standards of 6.5-9.0

Big Otter Creek is site #1 on the topographical map

Tributary Big Otter Creek 0.5 mile below AML is site #2 on the topo map

Big Otter Creek at Highway Z site is site #3 on the topo map

Big Otter Creek near mouth site is site #4 on the topo map

**For more information call or write:**

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